



Figure 1 and 2. Brown, angular leaf spot

What is Pseudomonas syringae pv actinidiae (Psa)?

Psa is a bacterial disease which affects kiwifruit species. It is spread by airborne spores so is, and can, move easily between plants and orchards in certain environmental conditions. The disease has been identified in kiwifruit for at least 25 years but has not been found in New Zealand until a recent identification in the North Island.

Psa has had a significant impact on Italian production in recent years. Good orchard hygiene is the key to reducing spread of any disease – see the orchard hygiene section below for more information.

What do Psa symptoms look like?

Brown, angular leaf spots sometimes surrounded by a yellowish halo are the symptoms seen at the affected site in New Zealand at this stage (Figure 1 and 2). Further images can be seen in the [Psa Pictorial](#). The spots are very easy to identify – no technical expertise is required.

What should growers do?

All growers regardless of orchard size, variety or location need to check their vines for Psa symptoms as explained below. Growers also need to work with suppliers and neighbouring orchards to understand the risk and updates are available on The Canopy (www.zespricanopy.com). Please complete the following steps:

Walk throughout the orchard looking at the leaves on each vine carefully for the symptoms shown in the Psa pictorial. Use the spreadsheet (available on The Canopy) to gather information and monitor the symptoms. A digital camera, notepad, the spreadsheet, a pen and suitable vine markers are the only tools needed to make the initial assessment

If no symptoms are identified	If you see Psa symptoms
<ul style="list-style-type: none"> • Usual orchard activity should continue with increased orchard hygiene (see below). • Keep in touch with your neighbours and supplier to monitor the risk to your orchard. • Check The Canopy for further developments and notifications. • Complete the spreadsheet, confirming no symptoms were observed. • Email or fax the spreadsheet to contactcanopy@zespri.com or fax 07 572 7646. The email subject line should read '(KPIN) Psa' e.g. 0000 Psa. 	<ul style="list-style-type: none"> • Do not remove any part of the vine. • Immediately take a close-up digital photo of the suspected symptoms, including photos of leaf spots, possible cankers, dieback or oozing. • Email or fax the photo/s and spreadsheet to contactcanopy@zespri.com or fax 07 572 7646. The email subject line and the photograph file name should read '(orchard KPIN) Psa' e.g. 0000 Psa. • The photograph will be evaluated and ZESPRI will endeavour to notify growers of the initial assessment within 48 hours. • If the photographed symptoms are considered a risk, ZESPRI will also notify MAF. • If the symptoms supplied are not considered a risk, the grower will be notified by ZESPRI as soon as possible and normal orchard activity should continue with increased hygiene. • Once MAF are notified of the symptoms, sampling and testing for confirmation of Psa will take place. <p>In the interim restrict unnecessary orchard access that is not related to the management of the orchard.</p>

Ongoing orchard work

Growers without symptoms should continue orchard activity with increased orchard hygiene. Growers of orchards showing symptoms of Psa need to carefully consider on site activities in order to minimise any risks. ZESPRI and suppliers will support growers directly. Contractors will be notified of the risk and should follow strict equipment hygiene.

Orchard Hygiene

Regardless of whether orchards show symptoms of Psa, the key risk of Psa spread is movement of bacteria from infected to uninfected plants and orchards therefore orchard hygiene is critical. Bacteria spreads through the air, on living or dead plant material, machinery and other equipment. It is important to:

- Contact any contractors before they enter the orchard to make them aware of risk areas and ensure they have clean equipment.
- All equipment used on-orchard, including pruning equipment, should be sterilised in bleach or alcohol between orchards, and within suspected infected blocks.
- Hose off machinery before this leaves the orchard to remove any vegetative material.
- Do not mulch prunings from vines showing symptoms – leave these and wait for further advice. Mulching of prunings from vines not showing symptoms should occur under moist conditions to minimise any aerial spread.
- Human transfer is considered low risk, although hand washing after handling suspect material and the treatment of footwear is recommended.

What happens to individual growers if Psa is confirmed on their orchard?

Growers will hear from ZESPRI first after assessment of the photographs. If symptoms are suspected MAF will be notified and the grower will be contacted (further to ZESPRI's contact) within one week to organise sampling and testing. Growers involved in this process need to be aware of the following:

- ZESPRI and MAF will work with growers that have Psa positively identified on their orchard to mitigate the risk to the rest of their orchard and surrounding orchards. Further information including any actions, control of spread, treatments and hygiene advice will be provided directly to the grower.
- Experience overseas has shown rapid response is required to control Psa on a regional level. Until the bacteria is fully identified, the recommended action will not be known, however it will require rapid action once known.
- Orchard hygiene is critical to reduce the risk of spread, see above for more information.
- Growers decide the plan of action to reduce their risk of Psa. ZESPRI will support growers with as much as information and support as possible. However, failure to comply with MAF instructions may compromise any compensation. See www.biosecurity.govt.nz/biosec/pol/compensation for more information.

Orchards in the affected area are likely to have more detailed assessment undertaken in the near future. This is part of ZESPRI monitoring protocol (refer to Kiwitech Bulletin #71 'Guidelines for Monitoring Bacterial Canker' which was originally for Italian use but has now been adapted for New Zealand use).

Further Information

Refer to the Psa section of The Canopy (www.zespricanopy.com) for up-to-date information on Psa or contact your supplier or the ZESPRI Grower Contact Centre by phoning **0800 155 355** if you have any further queries.

ZESPRI's purpose in providing the enclosed information is to give growers the most recent information known to ZESPRI about Pseudomonas syringae pv actinidiae (Psa) in an effort to assist growers to identify if Psa is present in their orchards, and, if so, to take such steps as are appropriate to prevent further spread of the bacteria within their own orchards and the wider industry.

Much of the enclosed information is based on what is known about Psa from other growing regions, with specific information regarding treatment of the symptoms which (based on early data) appear to be most prevalent in New Zealand.

Growers should be aware that no compensation for losses arising from preventative or eradication measures will be available to growers unless such measures have been expressly notified to the individual grower as being required by MAF.

Neither of ZESPRI Group Limited & subsidiaries ("ZGL") nor the New Zealand Institute for Plant & Food Research Limited ("P&FR") make any warranty, representation or guarantee as to the accuracy and/or completeness of the information regarding Psa and potential treatments. Although the suggested treatments to limit and treat this disease referred to in the enclosed information are based on scientific data, neither ZGL nor P&FR shall be liable to any person for any loss arising from that person's reliance on the information and/or for any damages arising out of or connected with the use of the enclosed information.